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either of the above formulæ, as representing the composition of the most explosive gun-cotton, and demonstrate satisfactorily that the material, prepared strictly according to the system of manufacture perfected by Von Lenk, consists uniformly of the substance now generally known as trinitro-cellulose, in a nearly pure condition.

- IV. "On the Mysteries of Numbers alluded to by Fermat." By the Rt. Hon. Sir FREDERICK POLLOCK, Lord Chief Baron, F.R.S., &c. Received March 19, 1866. [See page 115.]

April 26, 1866.

J. P. GASSIOT, Vice-President, in the Chair.

The following communications were read :—

- I. "On the Dentition of *Rhinoceros leptorhinus* (Owen)." By W. BOYD DAWKINS, M.A., Oxon., F.G.S. Communicated by Prof. J. PHILLIPS, F.R.S. Received March 28, 1866.

(Abstract.)

The fossil remains of the genus *Rhinoceros* found in Pleistocene deposits in Great Britain indicate four well-defined species. Of these the *R. tichorhinus*, or the common fossil species, ranged throughout France, Germany, and Northern Russia, and, like its congener the Mammoth, was defended from the intense winter cold by a thick clothing of hair and wool. Its southern limit in the Europæo-Asiatic continent was a line passing through the Pyrenees, the Alps, the northern shore of the Caspian, and the Altai Mountains. It has not yet been proved to have existed in Europe anterior to the deposit of the Boulder Clay. The second species, the *R. megarhinus* of M. de Christol, characterized by its slender limbs and the absence of the "cloison," has been determined by the author among remains from the brick-earths occupying the lower part of the Thames valley, and from the Preglacial forest-bed of Cromer. The species ranged from the Norfolk shore southwards through Central France into Italy. In France and Italy it characterizes the Pliocene deposits, being found in the former country in association with *Mastodon brevirostris* and *Halitherium Serresii*, in the latter with *M. Arvernensis*. From its southern range we may infer that the megarhine species was fitted to inhabit the warm and temperate zones of Europe, just as the tichorhine was peculiarly fitted for the endurance of an Arctic winter.

The third species is the *R. etruscus* of Dr. Falconer, confined to the forest-bed of the Norfolk shore, and, like the *R. megarhinus*, found in the Pliocenes of France and Italy; it ranged across the Pyrenees as far as Malaga, and is the only species known to occur in Spain.

The fourth, the *R. leptorhinus* of Professor Owen, is the equivalent of

the *R. hemitæchus* of Dr. Falconer. It is defined as “*R. à narines demi-cloisonnées*,” and is probably not the same animal as the *R. leptorhinus* or “*R. à narines non-cloisonnées*” of Baron Cuvier, the evidence as to the absence or presence of the cloison in the type of the species being of the most conflicting nature. In Central France it is identical with *R. mesotropus* and *R. velaunus* of M. Aymard, the *R. Aymardi* of M. Pomel, and the *R. leptorhinus* (du Puy) of M. Gervaise. Its dentition is characterized by the presence of the *third costa* in the upper molar series, coupled with the stoutness of the cingulum, the suppression of the *anterior combing plate*, the smoothness of the enamel, and the extent to which the upper molars overhang the lower, which causes the enamel on the outer side of the latter to be worn obliquely. The lower molars can be determined by the flattening of the *anterior area*, coupled with the fine sculpturing of the enamel-surface. In common with the other fossil British Rhinoceroses, it possessed a molar series of six only on either side, and was bicorn. It ranged through England, from the Hyæna-den of Kirkdale in Yorkshire in the north, as far south as the plains of Somersetshire, and as far to the West as Pembrokeshire. It is very generally found in association with *Elephas antiquus* and *Hippopotamus major*, both species which lived in Pliocene times. The association in Wookey Hole Hyæna-den with *Elephas primigenius* and *R. tichorhinus* and other characteristic Postglacial mammals proves that it coexisted with the tichorhine species, to which it probably bore the same geographical relation as the Elk does to the Reindeer in the high northern latitudes. The sum of the evidence proves that it was coeval with the Mammoth and tichorhine Rhinoceros, and does not characterize deposits of an earlier epoch in the Pleistocene. It has not as yet been found in Preglacial formations. The *R. leptorhinus* is more closely allied to the bicorn Rhinoceros of Sumatra than to any other living species.

II. “Experimental Researches in Magnetism and Electricity.”—

Part I. By H. WILDE, Esq. Communicated by Mr. Faraday.
Received March 26, 1866.

(Abstract.)

This paper is divided into two sections,—the first being on some new and paradoxical phenomena in electro-magnetic induction, and its relation to the principle of the conservation of physical force; the second on a new and powerful generator of dynamic electricity.

The author defines the principle of the conservation of force to be the definite quantitative relation existing between all phenomena whatsoever; and in the particular application of the principle to the advancement of physical science and the mechanical arts, certain problems are pointed out which, in their solution, bring out results as surprising as they are paradoxical. Although, when rightly interpreted, the results obtained are in